What is claimed is:

1. A method of producing a polycrystalline thin film on a film forming surface of a polycrystalline substrate, the polycrystalline thin film comprising oxide crystal grains having a C-type rare earth crystal structure represented by a formula Yb_2O_3 and having a grain boundary inclination angle of 30° or less which is formed by identical crystal axes of the crystal grains along a plane parallel to the film forming surface of the polycrystalline substrate,

the method comprising:

depositing constituent grains emitted from a target comprising constituent elements of the polycrystalline thin film;

setting a temperature of the polycrystalline substrate within a range from 150°C to 250°C during depositing the constituent grains;

generating an ion beam of at least one of Ar^+, Kr^+, and Xe^+ from an ion source;

adjusting the ion beam energy of the ion beam within a range from 175 eV to 225 eV; and

irradiating the ion beam, having the adjusted ion beam energy, on the film forming surface of the substrate at an angle of incidence from 50° to 60° with respect to the normal of the film forming surface while depositing the constituent grains on the substrate.

2. A method of producing a polycrystalline thin film according to claim 1, wherein the polycrystalline substrate is one of a board, a plate, a wire, a tape.

3. A method of producing a polycrystalline thin film according to claim 1, wherein the polycrystalline substrate is formed by at least one of silver, platinum, stainless steel, copper, an Ni alloy, glass and ceramics.

4. A method of producing a polycrystalline thin film according to claim 1, wherein the temperature of the polycrystalline substrate is set from 175°C to 200°C during depositing the constituent grains.

5. A method of producing a polycrystalline thin film according to claim 1, wherein:

first axes of the oxide crystal grains of the polycrystalline thin film align normal to the film forming surface of the polycrystalline substrate;

second axes of the oxide crystal grains of the polycrystalline thin film are aligned with respect to each other and oriented parallel to a plane of the film forming surface of the polycrystalline substrate,

third axes of the oxide crystal grains of the polycrystalline thin film are aligned with respect to each other and oriented parallel to a plane of the film forming surface of the polycrystalline substrate, and

the second axes is perpendicular to the third axes.

6. A method of producing a polycrystalline thin film according to claim 1, wherein the the polycrystalline substrate does not comprise YSZ or MgO, and no layer having YSZ or MgO is formed between said film forming surface of the polycrystalline substrate and said polycrystalline thin film.

7. A method of producing an oxide superconducting element that comprises a polycrystalline substrate, a polycrystalline thin film comprising oxide crystal grains having a C-type rare earth crystal structure represented by a formula Yb_2O_3 formed on a film forming surface of the polycrystalline substrate and having a grain boundary inclination angle of 30° or less which is formed by identical crystal axes of the crystal grains along a plane parallel to the film forming surface of the polycrystalline substrate, and an oxide superconductor layer formed on the polycrystalline thin film,

the method comprising:

depositing constituent grains emitted from a target comprising constituent elements of the polycrystalline thin film;

setting a temperature of the polycrystalline substrate within a range from 150°C to 250°C during depositing the constituent grains;

generating an ion beam of at least one of Ar^+, Kr^+, and Xe^+ from an ion source;

adjusting the ion beam energy of the ion beam within a range from 175 eV to 225 eV;

irradiating the ion beam, having the adjusted ion beam energy, on the film forming surface of the substrate at an angle of incidence from 50° to 60° with respect to the normal of the film forming surface while depositing the constituent grains on the substrate; and

forming the oxide superconductor layer on the polycrystalline thin film.

8. A method of producing an oxide superconducting element according to claim 7, wherein the oxide superconductor layer is selected from the group consisting of

the compounds $YBa_2Cu_3O_{7-x}$ (0<X<0.5), $YBa_2Cu_4O_8$, $(Bi, Pb)_2Ca_2Sr_2Cu_3O_{10}$, $Tl_2Ba_2Ca_2Cu_3O_{10}$, $Tl_1Ba_2Ca_2Cu_3O_9$, and $Tl_1Ba_2Ca_3Cu_4O_{11}$.

9. A method of producing an oxide superconducting element according to claim 7, wherein the the polycrystalline substrate does not comprise YSZ or MgO, and no layer having YSZ or MgO is formed between said film forming surface of the polycrystalline substrate and said oxide superconductor layer.